

The Signs of Death.

By Dr. ANDREW WILSON. See page 408.

♦ HEALTH ♦

A WEEKLY JOURNAL OF
DOMESTIC AND SANITARY SCIENCE.

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EDITED BY DR. ANDREW WILSON, F.R.S.E. &C.

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FRIDAY, MARCH 29, 1889.

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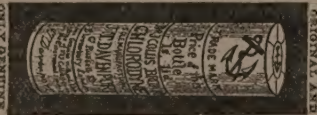
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• HEALTH •

EDITED BY

DR. ANDREW WILSON, F.R.S.E., &c.

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Notes by the Way

BY THE EDITOR.

"Health is the foundation of all our physical happiness."—Herder.

THE next number of HEALTH—that for April 5th—begins a new volume, our THIRTIETH. I again ask my readers to make known the claims of HEALTH, as a family and household friend and adviser, to their friends. The bonuses offered to yearly subscribers will be found duly announced in each number of HEALTH, and the present is, therefore, an appropriate time to enrol new readers. Remembering what HEALTH owes to the kindly recommendations of its readers in the past, I am tempted once more to ask their aid in extending our already large circulation.

AMONG the topics to be treated in our new volume may be named, the second series of Dr. Drinkwater's papers on "Household Chemistry," and a series of articles on "The Law in Relation to Health," by Mr. J. Ridley Shield. I have arranged for the publication of papers on "Gymnastic Exercises in Relation to Health," by Miss E. F. White, "Gymnastik-Director" of the Royal Gymnastic Institute of Stockholm. These serial articles will be supplemented as usual by popularly written and illustrated papers by various writers on such topics of the time as are related to health; while, as of old, my

own pen will always be foremost in catering for the instruction and edification of our readers. Our programme being thus of varied nature, I may fairly commend HEALTH, now in its seventh year of existence, to the notice of the public. Its aims, as an educator of the people in all that concerns their physical well-being, remain the same as of yore; and for the large measure of success which has attended its educative efforts I once more tender to all concerned my sincere and hearty thanks.

THE following account of heroic endurance on the part of an aged Japanese woman is worth recording, if only as an example of the perfect manner in which the human mind may brace the body to bear pain of intense kind:—At Surugadai, in Tōkyō, says the *Sei-i-Kwai Medical Journal*, lives Mr. Tanabe, a gentleman in easy circumstances. His mother, an inmate of the same house, has attained her sixtieth year, but until quite lately was a hale and hearty lady, much beloved for her virtues and esteemed for her accomplishments. The changes of these topsy-turvy times have not shaken her adherence to the faiths and fashions of ancient days. In her eyes the Japanese *samurai* still exists, though his name has been erased from the national ledger, and his place usurped by inferiors. A few months ago her wonted health began to fail. She was attacked by a malignant disease formerly held fatal, and now known to be curable only by extreme measures. At the Hongo Hospital Dr. Sato told her that a severe surgical operation could alone save her life. Was it possible that a lady of her age should survive such a method of treatment? Dr. Sato said there was good hope, and, after anxious consultation, her family consented to follow his advice. The old lady at once became an inmate of the hospital.

AFTER she had undergone the necessary preparation, Dr. Sato himself undertook the operation, in the presence of the chief surgeons of the Naval and War Departments and of the Imperial University. Two deep incisions in the bosom had to be made, and the assistants were about to administer chloroform. The old lady asked what was the nature of the medicine. Being told that its function was merely to deaden pain, she said that she had no need of such things. She had heard of anodyne drugs that send patients to sleep under the surgeon's knife. She preferred to remain awake. Among her friends of former days was a loyal soldier, by name Miyoshi. Fate willed that he should die by his own sword. He had disembowelled himself in her presence, and, with a wide wound gaping in his bosom, had composed and written

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his death-song. She had witnessed this thing with her own eyes. It was her notion of the example a *samurai* ought to set, and, though a woman, she preferred to emulate such a spirit rather than to take refuge from pain in narcotics. With that she laid down, and bared her bosom to the knife.

Dr. Sato proceeded with the operation. He made two incisions under the left breast, and two smaller incisions above. The morbid growth was removed, and twenty stitches were put in. During the whole process the old lady never made a movement or uttered a groan. Not until Dr. Sato asked whether she had suffered much pain did she open her eyes and reply quietly that the cutting of live flesh is never without suffering. Her son, who was by her side throughout, would now have answered the various inquiries that had come by telegraph and messenger, but the old lady insisted on writing four letters herself to reassure her friends. Dr. Sato declared, as well he might, that he had never, in all his experience, encountered so much fortitude and power of endurance. The *Nichi Nichi Shimbun* tells the story as an evidence that the old *samurai* spirit survives in Japan. In the country of the "happy despatch" the old spirit of heroism, it would seem, is not yet extinct.

"How to live on sixpence a day" is likely to be a problem entirely shelved by the solution of how to live on a shilling a week. An old lady, who lives in White-chapel, London, says a contemporary, spends a weekly shilling as follows. Her rent is paid for her, and her weekly allowance consists of relief tickets for $\frac{1}{2}$ cwt. of coal, one 4-lb loaf, 2 ozs. of tea, $\frac{1}{2}$ lb. sugar, and 1s., which is spent as follows:—Clothing-card, 2d.; oil and wood, 1d.; meat, 3d.; soap, 1d.; butter, 2 $\frac{1}{2}$ d.; vegetables, 1 $\frac{1}{2}$ d.; apples (for dumpling), $\frac{1}{2}$ d.; flour, $\frac{1}{2}$ d.; total, 1s. The "meat" means either bones or the trimmings of fish and meat from an eating house. She and another old woman put by one lump of coal each week, and this lasts them through the summer months, when the coal tickets are not given out.

It has been said that every work of invention has its parallel in nature. But it would not be anticipated that the method of raising sunken steamers by forcing air into casks which have been secured to them would find such a parallel. Yet such has been the case on the Ohio River, where the steamer Robert B. Carson sank near Evansville, Indiana, drowning thirty head of cattle that were confined on the lower deck. Efforts to pump the vessel out were not successful, and the boat was abandoned. A few days later, however, it was found to be floating, the fact being that the putrefying carcasses of the cattle had become inflated by the gases generated in putrefaction, and their combined buoyancy was sufficient to raise the steamer again.

A CORRESPONDENT of the *Chemist and Druggist* writing about "a soberer" for drunken persons, says that the *British Medical Journal* gave an account of a drunk doctor having chewed a piece of ammon. carb., "which acted as an instantaneous soberer. This," says the correspondent, "certainly is no new discovery. I have known of it as being used for this purpose for at least a dozen years. Ammon. carb. one scruple, in effervescence with acid. acetic dil. half an ounce, or liquor ammon. acetatis one ounce, produces all that could be desired. I have frequently given—not taken—the latter with satisfactory results." The correspondent's caution, "not taken," is at once humorous and satisfactory.

Original Essays

"Life is not to live, but to be well."—*Martial*.

VEGETABLES AS FOOD.

By M.D.

ONE very prevalent but mistaken notion on the part of the public who are uninstructed in the chemistry of foods, is that all vegetables are of much the same composition, and that all possess much the same value as foods. The result of this erroneous view of things is the undue depreciation of certain vegetables as foods, and the undue elevation of others.

I am not discussing the *pros* and *cons* of vegetarianism as a system of diet. Personally, I have no sympathy with those earnest but over-zealous folks who speak and write as if the dawn of the Millennium were an event dependent only and simply upon the renunciation of flesh-food. I purpose, in this article, to discuss, very briefly, the food-qualities of the principal vegetables we use. Every one, whether a vegetarian or not, recognizes that the plant world furnishes us with many excellent articles of food; and mixed feeders—a class which the vast majority of us represent—are among the first to allow, and, by their dietetic practice to assert, that to subsist on flesh-food alone would be a serious nutritive mistake. In a word, we cannot allow vegetarians to speak and write as if they alone valued the plant world as a source of food. Hence my demand for "more light" in this matter of vegetables, viewed as articles of diet. Possessing such knowledge, we may be the better able to select those vegetables as part and parcel of our diet which contain a sufficient proportion of the substances calculated to nourish the frame, or otherwise to maintain the health of the body.

It is clear that to chemistry we must look, in the first place, for information regarding the composition of the vegetables we use. Let us bear in mind the division of all foods, from whatever source derived, into a *Nitrogenous* and *Non-nitrogenous* class. The former group includes flesh-forming and tissue-building foods—such as *albumen* of meat-juice and white of egg; the *casein* of milk; the *gluten* of flour; the *gelatin* of bones; and the *legumin* of peas, beans, and lentils. The non-nitrogenous foods include (1) *water*, (2) *minerals*, (3) *starches* and *sugars* (or carbohydrates), and (4) *oils* and *fats*.

The oils and fats and starches and sugars are force-producing foods; that is to say, upon them we do the vast bulk of our muscular work. The water is a vital necessity for every living act; and the minerals, in turn, are most important in many ways less clearly understood at present. We cannot be healthy without a supply of certain minerals obtained from our food, such as compounds of lime, soda, and potassium, along with common salt (chloride of sodium), iron, and other inorganic substances. We shall note hereafter that vegetables, in certain of their food-aspects, are extremely useful and necessary as affording this mineral supply. Thus, *scurvy* is a disease which breaks out when the diet is too exclusively composed of fish or flesh; and we find the natural cure for this ailment to consist in the administration of fresh vegetables as food. The plants belonging to the botanist's order of the *Crucifera*, (represented by the cabbage, cross, mustard, and allied vegetables,) is notable as being singularly useful in the treatment of scurvy; and this property appears to depend specially on the amount of potash and other

minerals these plants contain. So, also, potatoes have been regarded as a cure for scurvy, on account of their mineral constituents.

This, no doubt, is a special phase of the employment of vegetables as foods; but it serves to illustrate very well the important use which plants subserve in the dietary of mankind. Dr. Pavy divides foods of vegetable nature into farinaceous seeds (wheat, oats, barley, rice, beans, &c.); oleaginous seeds, or nuts (almond, coconut, walnut, &c.); tubers and roots (potatoes, carrots, turnips, radishes, &c.); herbaceous articles (cabbage, seakale, celery, &c.), with fruits as sugar-containing products.

It may be readily supposed that this varied list of products of the plant kingdom implies wide differences in the chemical composition of the articles just named. Hence the question of the nourishing powers of vegetable foods turns on the amount of food principles they can be shown each to possess.

The following table, taken from Dr. Pavy (and representing the work of Payen), will show the relative proportion of food constituents in the common cereals:—

	Nitrogenous Matter.	Starch.	Dextrine, &c.	Cellulose.	Fat.	Minerals.
White (or soft)						
Wheat ...	12·65	76·51	6·05	2·80	1·87	2·12
Rye	12·50	64·65	14·90	3·10	2·25	2·60
Barley	12·96	66·43	10·00	4·75	2·76	3·10
Oats	14·39	60·59	9·25	7·06	5·50	3·25
Maize.....	12·50	67·55	4·00	5·90	8·80	1·25
Rice	7·55	88·65	1·00	1·10	0·80	0·90

[Save in the case of oats, the percentage composition in the above analyses is exactly given. In the case of barley, there is a deviation from the correct total of 0·04.]

A glance at this table will show us that while the ordinary cereals are fairly rich in flesh-forming principles (nitrogenous foods), rice appears low by comparison; while it rises highest as regards its starch, and is low in minerals and in fat. Hence, in the East, where rice forms the staple article of diet of millions of men, fat in the shape of oil or butter is added. In the making of a rice-pudding, the fat of the egg-yolk and of the milk will make up for the natural deficiencies of the rice in oils. Maize, like rice, is poor in minerals, but it is valuable from the large quantity of fat it contains. Barley is a fair average representative of the cereals; it has no constituent in excess, and it has none in very low quantity. Oats are rich in nitrogenous matter, in starch, and in fat as well. Hence the value of oatmeal as an article of diet; while its richness in minerals (and especially the phosphate of lime) renders oatmeal an admirable bone-forming food. The following is Dr. Letheby's analysis of oatmeal:—

Nitrogenous matter	12·6
Starches and sugars	63·8
Fats	5·6
Minerals	3·0
Water	15·0
	100·00

The *leguminous seeds*, or "pulses" as they are also named, differ widely from the preceding vegetables. The peas, beans, and lentils represent this group of plant-products. They are all specially characterized by possessing a considerable quantity of *legumin*, or *vegetable casein* as it is also termed, which is, in itself, a valuable form of nitrogenous food. Hence, the pure vegetarian looks chiefly to this class of plants to supply him with the flesh-forming material which the mixed feeder obtains (more readily and more digestibly, I would add) from flesh food. For Dr. Pavy himself tells us that the pea

and bean tribe are "difficult of digestion. They require prolonged boiling to render them tender and digestible. They are apt, besides lying heavy on the stomach, to occasion flatulence and colic." Personally, I should say Dr. Pavy's disadvantages would be largely, if not entirely, removed by giving the peas and beans in the form of soup. Pea soup, in this light, is both a very nutritious and easily-digested form of food.

The composition of beans is given as follows:—

	Horse Bean.	Broad or Windsor Bean—dried green, and the husk removed.
Nitrogenous matter	30·8	29·05
Starch	48·3	55·85
Cellulose	3·0	1·05
Fat.....	1·9	2·00
Minerals	3·5	3·65
Water	12·5	8·40
	100·00	100·00

The pea, dried, shows us less nitrogenous matter than the bean (23·8); more starch (58·7)—the cellulose being given as 3·5; the fat as 2·1; the minerals 2·1; and the water 8·3. No doubt exists, therefore, that peas and beans form a very nutritious and cheap form of food—regard always being had to the question of digestibility.

Passing now to the potato, cabbage, and like vegetables, as common articles of diet, we find the composition of potatoes to be clearly enough defined by chemists as follows:—

	1st Analysis.	2nd Analysis.
Nitrogenous matter	2·1	2·50
Starch, &c.....	18·8	20·00
Sugar	3·2	1·04
Fat	0·2	1·09
Minerals	0·7	0·11
Water.....	75·0	1·26
	100·00	74·00
		100·00

A potato, then, to put the matter popularly, is simply a mass of starch and water, the starch being present in small quantity—a fact which renders the potato a poor food, even if we desired it for its starch alone. Its minerals are also deficient; and at the best it is a useful adjunct to food rather than a food proper. We see the effects of potato-feeding in Irish and other famines, where the nutrition is at a low ebb when potatoes constitute the chief dietetic article. A man who wished to feed solely on potatoes as a food enabling him to do a fair day's work, would require to eat about eleven lbs. of them to represent the adequate amount of bodily fuel as regards work to be done. This estimate will show how poor a food a potato is, having regard to the fact that about 3½ lbs. of bread alone, or about ¾ lb. of meat and 2 lbs. of bread combined would represent fully the nutritive material contained in 11 lbs. of potatoes.

Carrots, when analyzed, are seen to be fairly rich in starch and sugar. In a percentage analysis of carrots, we find nitrogenous matter 1·3—a very low proportion—starch, 8·4; sugar, 6·1; fat, 0·2; minerals, 1·0; and water, 83·0. The parsnip is similarly rich in starch, 9·6 per cent.; and sugar, 5·8 per cent. The turnip has 91·0 per cent of water, the nitrogenous matter being given as 1·2; the starch as 5·1; the sugar as 2·1; and the minerals as 0·6. All these vegetables can only be useful from the amount of starch and sugar they contain. As tissue-formers, they are practically useless; and they can, therefore, simply be regarded as desirable additions to our food-tables, rather than as representing in themselves actual foods sufficient, or largely so, like flesh, oatmeal, and peas, and beans, &c., to maintain the bodily organism.

Cabbage contains about 90 per cent. of water; its starch and sugar are therefore present in very small proportions, but it is for its *minerals* that it is a valuable food, and more especially in that it supplies potash to the blood. Cabbages, greens, Brussel sprouts, savoys, cauliflower, and broccoli are all to be ranked together in this respect. They are necessary for us as supplying us with mineral foods in an easily-assimilable form. As scurvy-preventers (anti-scorbutics), they have the highest value.

The onion is regarded largely as a flavouring agent or condiment, and as such appears in salads; but this vegetable should be more highly valued, on account of the amount of sulphur it contains. It is a most excellent vegetable, and possesses anti-scorbutic properties, like the cabbage tribe; a point in which the watercress likewise agrees.

Of fruits, space-considerations do not permit me at present to speak. To this subject I hope to return in a future article. Meanwhile, we may clearly enough discern that while vegetables form an important and necessary part of our diet, it is well that we should select and use them intelligently, and with due regard to the properties they possess and nutriment they severally contain.

THE SIGNS OF DEATH.

By DR. ANDREW WILSON.

THIRD AND CONCLUDING PAPER.

WHEN blood is withdrawn from a living animal it coagulates, or "clots," and this process is seen to occur more slowly in the case of venous than in that of arterial blood. If, accordingly, the blood in a vein is found to be clotted, this may be taken as a sure proof of decease; since, as our author remarks, the act of coagulation is really one with that of the stiffening of the muscles. Yet, even here, there is not wanting the proverbial exception to the rigid rule. In the case of the lady mentioned in the former paper, regarding whose death doubt was expressed, Dr. Richardson tells us that "on testing the limbs there was no sign of rigidity, and on opening a vein the blood, which flowed as freely as at a venesection, though without elevation of flow, remained quite fluid for many hours, and indeed never underwent firm coagulation at all. Here also five days after death the same phenomena were repeated, and the opened veins had to be firmly ligatured to prevent a continued flow. In such examples as these, two of the most telling proofs of death are absent, and we have to wait or find others by which to come to a correct conclusion. Of these phenomena, consequently—*rigor mortis* and *coagulation of blood*—it may be said that, if present, they are a sufficient proof of death, but that their absence is, *primâ facie*, evidence that life may not have passed away."

The remarks on the decomposition and decay of the body as tests of death may be quoted in full. Dr. Richardson says that "of *putrefactive decomposition* as proof of death little doubt is ever entertained. At one time putrefaction in its slightest development was regarded as conclusive; but the test received a check when it was observed that frogs under the influence of amyl nitrite may lie in semblance of complete death until the web of the foot undergoes putrefactive change, and even then come back to life. It may be that this is an exceptional experience, but it should not be forgotten; and, certainly, the mere odour of decomposition ought never to be accepted as a sufficient indication of death.

There are, however, certain decompositions which are definite, and one in particular, namely, that commencing in the eyeball. Whenever decomposition of the eyeball is pronounced, with shrinking of the ball and opacity of the cornea, it may be taken as certain that dissolution is absolute."

But he adds that "two conditions delay, as we have seen, the development of this test—extreme cold, or the presence in the body of some antiseptic substance, like alcohol. When doubts exist as to death having taken place, and when cold is favourable to preservation of the body, it is correct practice, therefore, to raise the temperature of the air of the room in which the body lies to summer heat. That practice is good in two ways: it gives a favourable chance to restoration, if so be that the vital fire is not out; and it very quickly determines that the vital fire is out, if that be the case, by the haste with which it brings forth the process of decomposition, heat being required as fully for the recompositions which constitute life as for the decompositions which demonstrate death."

Other and minor tests of death are given by our author, such as the strong light test, and the electrical test. In the case of the former sign, it was believed that, by placing a strong light behind any semi-transparent part of the body (*e.g.*, the hands, or junction of the fingers with the hands), a redness in the tint or colour of the tissues would indicate the presence of life. Our author attaches only secondary importance to this test, and adds that a powerful light, such as that of a magnesium lamp, should be employed in making it. The second test, of electrical stimulation of muscle, has, of course, a definite value. It is a highly popular test with the public. By electrical stimulation, properly applied, the muscles in a living body are made to contract. Muscular movement is thus to be regarded as a sign of life; but its absence, says Dr. Richardson, is a piece of evidence "not necessarily affirmative of death."

Montiverdi suggested the injection under the skin of thirty minims of a solution of ammonia, of the specific gravity of .891 degs. This procedure is described as follows: "The syringe is to be charged with the solution, and the fluid is to be slowly transfused. If the part receiving the ammonia is still vital, *i.e.*, if there be still a circulation through the part, there will be a reaction in the form of a blotch of a red erythematous colour, wine red, with raised spots on the surface. If death has taken place, instead of a red blotch, there will be a blotch of a dirty skin colour without a trace of red spots, which cannot be mistaken. This dead blotch, Montiverdi affirms, is the only criterion of actual death which is known at the present time, and when it appears on the injection of the ammonia solution five hours after an assumed death, it may be accepted with certainty that death is absolute."

A final test is that of Cloquet and Laborde. It is called "the bright steel test." Our author says "it is a test that may be used as corroborative of the other tests, if nothing more. A bright steel needle is thrust into a muscle; it is left for a short time, and then removed and put in a dry place. If the needle remains bright, it has pierced dead tissue only; but if it rusts (when placed where another and similar needle not so used does not rust), the inference may be drawn that oxidation is going on in the muscle pierced, and that, therefore, there is latent vitality still present in the body. There is, however, a fallacy in the application of this test which it is important to note. The period of its action is of limited extent. Soon after death, we are reminded, lactic acid

is formed in the muscles, so that this substance might produce on the needle the appearance of rust. The stage at which the needle test is applied is, in short, the essential condition for its success as a sign of absolute death. By itself, it is not at all a certain and sure indication of decease.

The summary of Dr. Richardson's views is both valuable and interesting. The vein-swelling test is first to be applied; then the vein is to be opened, to determine the presence of a blood-clot; then the electric test is to be made; and, finally, Montiverdi's ammonia test must be added to the others. "If all these signs point to death; if there be no indications of respiratory function; if there be no signs of movement of the pulse or heart, and no sounds of the heart; if the veins of the hand do not enlarge on the distal side of the fillet; if the blood in the veins contains a coagulum; if the galvanic stimulus fails to produce muscular contraction; if the injection of ammonia causes a dirty brown blotch; the evidence may be considered conclusive that death is *absolute*. To these proofs the strong light and bright needle tests may be added, but they are of minor importance."

Concluding his thesis, our author adds that "if these signs leave any doubt, or even if they leave no doubt, one further point of practice should be carried out. The body should be kept in a room, the temperature of which has been raised to a heat of 84 degs. Fahr., with moisture diffused through the air; and in this warm and moist atmosphere it should remain until distinct indications of putrefactive decomposition have set in. This final process has two practical advantages: it favours the development of *rigor mortis* when that has been deficient, and it enables the observer to carry out his responsible task in cases where he is not allowed to touch the dead, a condition not uncommonly enforced by members of the Jewish and other religious communities."

A final point, it seems, was raised in the course of the discussion which followed the reading of Dr. Richardson's paper at the Medical Society of London. He says that "a medico-legal question was raised during the discussion of the paper, in respect to ownership of the bodies of the dead. It was my contention that the body of a dead person was the property of the executor of that person, and that no direction of the deceased—a direction, for instance, that cremation should be carried out—was legally binding on the executor. It turns out that this is the fact, and that the power of an executor not only overrules the will of the dead, but of all their kindred."

I may express the opinion that this state of the English law is not as things should be. A man is surely entitled to indicate what should be done with his body after death. It would be a sorry thing if, say, a warm advocate of cremation as a health-measure should have his wish that his body should be cremated defied and rendered null and void by an executor; while it seems paradoxical to me that even the kindred of the dead should have no voice in the disposal of the body of their relative. Dr. Richardson is entitled to the thanks of the public, not only for his valuable paper on the signs of death, but for his unearthing of the legal anomaly just named.

CHEMICAL ANALYSIS.—DR. DRINKWATER, Lecturer on Chemistry in the Edinburgh Medical School, undertakes the Analysis of Water, Foods, Wall-Papers, and of all other products and articles connected with Household Health and Commercial Interests. Terms on application to Dr. Drinkwater, Chemical Laboratory, 41, Chambers-street, Edinburgh.

Personal Health

"Be timely wise;
With health all taste of pleasure flies."—Gay.

INCREASE OF DEFECTIVE VISION.

In the House of Commons on Feb. 28th, Dr. Farquharson drew attention to the statements recently made by responsible authorities as to the rapid increase in England of short sight and other forms of defective vision, and suggested that a competent ophthalmic surgeon should, by way of test, examine the children of some one Board School. Sir W. Hart Dyke, in reply, stated that the Department was quite alive to the importance of the question, and that the attention of the inspectors would be specially directed to testing the accuracy of the alleged facts. He added that in criticizing the plans of schools, special care was taken by the Department that enough light was secured, and that it fell in the right direction. It is to be hoped that this subject will not be allowed to drop.

It is extremely difficult, perhaps impossible, for any one to say that myopia or astigmatism is on the increase. Scarcely thirty years have passed away since the scientific investigation of errors of refraction was commenced in England. This occurred after the appearance of Donders' well-known treatise, and, it must be acknowledged, is a period too short to allow of any positive conclusions being drawn, since it is quite reasonable to maintain that the increase of such affections, as indicated by the larger number of children and adults who find it requisite to wear correcting glasses, is only apparent, and not real, being due to the recognition of the conditions requiring glasses, and to the better knowledge of the mechanical means of correction; but every ophthalmic surgeon would admit that there are at least five circumstances that, apart from hereditary predisposition, require attention, since each constitutes a factor in the production of myopia.

These are—the amount of work, the degree of light, the size and distinctness of the type used, the supply of food, and lastly the position which the child occupies in regard to his book. The folly of making young children work at high pressure has been too often dwelt upon in these columns to need repetition here. We are much disposed to insist on the abolition of evening lessons.

Teachers should be teachers in school hours, and not hearers of lessons worked up at home. In regard to light, Cohn, whose *Hygiene of the Eye* contains much useful information, maintains that there should be one square foot of window to every five square feet of floor, and that the light should, if possible, be allowed to enter from the south or east, and preferably from the south. The quantity of light should, at least, be sufficient to enable ordinary print to be read with ease in the darkest corner of the room.

The Roman type of the Board-School books, as we have personally tested, is exceedingly clear and good, and is certainly immeasurably superior to the German type, so that no improvement can be made in that direction. In regard to food, which is an extremely important point, it is difficult to say anything. Good food for the children depends, in most cases, on the willingness of the father to forego liquor, and on the thriftiness and intelligence of the mother; and some instruction in cookery, with less book-work, might be taught the girls with great advantage to the future

generation. Finally, the position of the child at the desk is a point that has scarcely been attended to in this country, though it has been much discussed abroad, and many patterns of desks have been exhibited at German meetings and societies, each having some advantage as to height or slope or position in regard to the bench on which the student sits.

All this requires careful attention, and Dr. Farquharson will have done good service to the pupils, not only of the Board Schools of this country, but to those of the numerous private and public seminaries, if he continues, from time to time, to remind the authorities that the more intelligent part of the community are keenly alive to the importance of physical conditions in developing diseases of the eye, which, when once established, are likely to be progressive, and which constitute a positive and insurmountable bar to the entrance into those very services for which all the hard work is undertaken.—

Lancet.

SKIN DEBILITY.

THE skins of the town-bred and of the country-bred differ widely, that of the latter being the more likely to be smooth and soft. Said a physician the other day, "I do not think town-folk should apply any oil to their skin." He was absolutely wrong in his impressions. The dark appearance of those living much in towns conveys the incorrect notion that the skin is too oily, while it is really deficient in this principle. Impure air, table-indiscretions, and late hours, exert a peculiarly disastrous effect upon the skin.

To these evil factors should be added the soaps and cosmetics in vogue. Soaps, as everyone knows, contain alkalis in combination with fatty acids. It is the alkali in the soaps that clears away the fat and dirt, and, at the same time, dries the skin and renders it liable to eruptions and decay. Hence the shrivelling and wrinkling. Besides containing soda or potash, many soaps are contaminated with vermilion, a mercurial compound of chrome red, a preparation of lead and fuchsin, one of the coal-tar colours frequently contaminated with arsenic. Professor Jamieson says: "It is customary to add to soap cocoanut oil, to make it lather well, which tends to dry and render brittle the epidermis, so that a real detriment is obtained to gratify a popular prejudice." Then there are the highly perfumed soaps, injurious and objectionable in nearly every sense.

The risk of all contingencies in the way of soaps is removed by employing one which contains an excess of saponifiable fat instead of any free alkali. This extra fat prevents the alkali, set free when the soap is dissolved, from attacking the skin. A soap of the kind referred to is Vinolia Soap, a soap containing an excess of plastic emollient cream, and devoid of irritants and contaminating or extraneous admixture. As has been truly said, other forms of soap dry the skin to a greater or less degree, and remove its oil and suppleness. Vinolia Soap is cleansing, lathers beautifully, is perfumed with a rare redolent French rose of exquisite fragrance, and is antiseptic, bland, and emollient.

It is a highly suitable soap for an infant's skin—indeed, it is unequalled for the nursery, toilet, and bath. It is pleasing, grateful, and refreshing for patients to use, and forms a happy contrast with the usual injurious saponaceous products. Used in shampooing, it does not whiten the hair, or dry and injure it, causing it to come out, nor does it weaken the scalp. The presence of the extra saponifiable cream renders the soap a refreshing balm and cleansing tonic to the skin. It has been pro-

nounced by leading authorities the purest, blandest, and only scientific soap thus far manufactured, and the only one those who prize the health of the skin should use.

A NEW DEODORANT.—Bromine has for a long time been recognized as being valuable in the treatment of gangrene and foul-smelling ulcers; but until recently its merits as an effectual and cheap deodorant have not been appreciated, according to the *New York Medical Journal*. It was brought into prominence a few months ago by Mr. Martin, the chemist of the health-department of this city, who suggested its use upon the earth thrown up in laying the electric subways. As it is a by-product obtained in the manufacture of salt, and is not used extensively in the arts, it is sold at a very reasonable price,—about seventy cents per pound. It has the property of precipitating the hydrocarbons of illuminating-gas, and thus can be used to deodorize the earth exposed in excavations in the vicinity of gas-mains. More valuable than this is its effect upon decomposing organic bodies, which it renders completely inoffensive. This property renders it particularly valuable for use in stables, privy-vaults, urinals, cesspools, or in any place which may contain foul-smelling organic matters. It is soluble in about thirty-three parts of water; but a solution of this strength is not advisable, as there is a constant escape from it of the vapour of bromine, which is very irritating to the eyes and air-passages, and which may even attack wood and metals. For ordinary purposes it is used in solutions containing one part by weight to about 800 of water. In this strength it may be used freely without its affecting anything which it may touch. A few gallons used daily will remove all ammoniacal odours from stables, or a few quarts will thoroughly deodorize the entire plumbing system of an ordinary house. It also might be used with advantage upon ordinary house-garbage, which usually becomes offensive so speedily in warm weather. There would appear to be scarcely any limit to its usefulness in this branch of sanitary science; and it will, as soon as its merits are better known, undoubtedly be adopted universally as a substitute for the deodorants now in use, which usually act by substituting one unpleasant odour for another. The only drawback in its use lies in the fact that the undiluted bromine is strongly corrosive, and, if it touches the skin, causes a painful burn. Where it is used in large quantities, this can be obviated by opening the bottle, or, what is simpler, breaking it, under water. As its use becomes more extended, it will, undoubtedly, be put up in pearls or tubes containing only as much as would be needed at one time in the average household.

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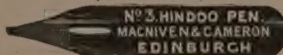
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"The child is father of the man."—Wordsworth.

"In bringing up a child, think of its old age."—Joubert.

THE NUTRITION OF INFANTS.

"EVERY occurrence in Nature," says Tyndall, "is preceded by other occurrences, which are its causes; and succeeded by others, which are its effects." An exemplification of the truth of this statement is found in infant-feeding. The indigestion of the infant is preceded by improper feeding, and succeeded by wasting and malnutrition. Again, what we eat is preceded by certain physical circumstances, and succeeded by others. Dr. Draper writes, in that most philosophical of works, the *Intellectual Development of Europe*, as follows: "Would any one deny the increasing difficulty with which life is maintained as we pass from the southern peninsulas to the more rigorous climates of the north?"

"There is a relationship between the mean annual heat of a locality and the instincts of its inhabitants for food. The Sicilian is satisfied with a light, farinaceous repast and a few fruits; the Norwegian requires a strong diet of flesh; to the Laplander it is none the less acceptable if grease of the bear, or train-oil, or the blubber of whale be added. Meteorology, to no little extent, influences the morals—the instinctive propensity to drunkenness is a function of the latitude. Food, houses, clothing, bear a certain relation to the isothermal lines."

The requirements of infant life may at first seem less variable than those of adults, for the reason that any demands of climate, &c., made upon the child will likewise be made upon the mother's system, which will provide accordingly. It is, however, in the domain of artificial infant-feeding, that the difficulties of satisfying the infant's needs are fully appreciated. Not yet have we sifted the problem to the bottom; but there is enough known to enable parents and nurses to save many lives that are now sacrificed to ignorance; and the lives so sacrificed are nothing, compared with the physical infirmities, the mental weaknesses, the disease, grafted upon countless beings, simply and solely by improper feeding.

At the head of the evils to infant life, unquestionably starch occupies the first place. Never yet was a valid reason adduced for giving infants starchy foods. The only possible good that starch can effect is in its rendering the cheesy curds of cows' milk less dense and more crumbly. "I gave my child starchy food," responds one, "and he did all right." Then, we say, your child had a remarkably good constitution. Let this truth be borne in mind: mothers' milk contains no starch, and there is practically no provision in the infant economy for the digestion of starch.

Liebig found that, of deaths among infants from all causes, one-half was due to starchy foods. He advocated giving infants malted foods; that is, grains, the ingredients of which had been rendered soluble by germination and then infusion and concentration. The best example of this kind of food is the Kepler extract of malted barley. A little of this (a teaspoonful) added to each pint of milk will prevent the rigid curdling better than starchy food, and will prove a grateful demulcent to the tender alimentary tract of the child, instead of an irritant, like the insoluble starch. Dr. Clendennin recently reported a case where the infant had wasted fast, and was rapidly dying, though no end of foods had been tried. Cows' milk, diluted, and containing half a teaspoonful of Kepler Extract of Malt, soon effected a perfect restoration to health.

HOW CONSUMPTION IS CONVEYED.

DR. WILLARD H. MORSE, writing on this topic in the *New England Medical Monthly*, says:—

Permit me to refer to an experiment of my own. Three healthy guinea-pigs were selected. One was inoculated with consumptive matter and placed in a small box with one of the others. The third was confined in a box in an adjoining room. They were cared for alike and had similar food. In four weeks the first one died, and the examination showed tubercle in the lungs and a large cheesy gland near the point of inoculation. Three weeks after the second animal sickened and was killed. I found small granulations scattered through both lungs, at some points aggregated, and in the right lung were two nodules having a soft, cheesy centre. The third guinea-pig, examined three months later, had no evidence of tubercle or other disease.

The only experiment, so far as I know, upon a human subject was made by Drs. Demet, Pararky, and Zallories, of Syra, in Greece, who inoculated with sputa from a phthisical patient a man whose history afforded no suspicion of tubercle and whose lungs were healthy, but who had gangrene due to femoral embolism, and who would not permit amputation. In three weeks auscultation revealed evidences of disease at the right apex. Thirty-eight days after the inoculation the man died from gangrene, when it was found that the upper right lobe had seventeen small tubercles and two granulations in the apex of the left lung.

What has been the practical experience of others?

One of the most valuable labours of the Collective Investigation Committee in London is that relating to the transmission of phthisis. While the majority of replies to inquiries were unsupported negatives, two hundred and sixty-one answers coming from physicians in family practice affirmed the proposition that phthisis may be communicated from the sick to the well, and evidence was given in proof of the statement. One hundred and ninety-two observers recorded cases where both husband and wife became phthisical, in one hundred and thirty cases there being no phthisis in the family of the one to whom the disease was thought to have been transmitted. Some of these cases were very interesting. Dr. Spriggs, of Great Bedford, instanced the case of

Miss R., aged 48, a dressmaker, who, living in rather a lonely cottage at C., Bedfordshire, had three apprentices, young girls from 17 to 19 years of age, not related, from three adjoining villages, who took it in turn to remain in the house and sleep with her, each one week at a time. During their apprenticeship, Miss R. was taken with phthisis, of which she died. In less than two years afterwards all three apprentices died of phthisis, although in the family history of each, no trace of phthisis existed; and the parents, brothers, and sisters of two are alive and well at this time.

Another interesting case is related by Mr. G. F. Blake, of Moseley, Birmingham, in which a perfectly healthy child, with a family history free from all trace of tubercle, is reported as becoming infected by a phthisical nurse, and having died with profuse hæmoptysis after the disease had run a rapid course.

The following cases were reported to the Clinical Society of London by Dr. Herman Weber:—

"A young man who had lost his mother, two brothers, and a sister by phthisis, and who himself had twice had hæmorrhage from the lungs, had quite recovered, and married at 27, being then perfectly well. His first wife was in good health, and came of a healthy family. She

died of consumption after her third confinement. The man shortly married again, an apparently healthy woman, and his second wife, after a year of married life, died of 'galloping consumption.' He again married a healthy young woman of 25, belonging to an exceptionally healthy family. During her second pregnancy she developed symptoms of phthisis, which ran a rapid course, and ended fatally in about eight months. Undaunted, this man married a fourth wife, a perfectly healthy woman of 23, of healthy antecedents. Three months after her first confinement she began to show symptoms of phthisis, and notwithstanding two sea-voyages, died after months with tubercle in liver, spleen, and intestines, as well as in the lungs. Though the husband of these four wives, who was a sailor, remained in apparently good health, physical examination revealed the existence of morbid changes about the apex of the left lung.

It is possible that the life at sea kept his disease in abeyance, for when he had to lie by on account of a severe fracture, the disease became active, and he died of consumption within two years.

A convincing report of a case in which the portagiousness of phthisis is affirmed, served as an introduction to a valuable paper last year by Dr. F. I. Knight, of Boston; and who has not read the evidence offered upon this subject by Webb?

I need not farther collate records, for you gentlemen, being conversant with medical literature, will grant that new and strong proof of the proposition which we have announced is being constantly given.

What have been our own observations?

In more than three hundred cases of phthisis, I have kept a record of the family history, and find that fifty-one per cent of this number were of families in which some other case had occurred. The inquiry extended no farther than to first cousins. Heretofore this would be accepted as evidence in favour of heredity of phthisis, but I now believe that in many of these cases the disease was acquired by the carrying of the products of disease to a subject whose physical condition favoured its reception and development.

I recall the case of Mrs. L., in whose family was no trace of phthisis. Before her marriage, and for several years after, she was the ideal of a healthy woman. Two children were born. Her husband, a well-known city official, had phthisis. Her attendance upon him was constant, and for some months before his death she and the younger child were with him night and day. When called to attend him, I found that he had been substituting for the ordinary cuspidore, a newspaper spread upon the floor at his bedside, and this would be loaded with sputa each morning.

The case was rapid. The husband died, and within eighteen months Mrs. L. and the younger child also died from phthisis; while the eldest daughter, who was comparatively little in the sick-room, still lives, and is well and strong.

I have the notes of other instances almost as instructive, but this will suffice.

From such facts as I have endeavoured to give in this paper, I believe it is fair to concede the probability of the portagiousness of phthisis.

How, then, can the disease be conveyed?

In two ways, namely: First, by the air carrying particles of disease into the respiratory tract. Second, by food from infected sources, through the alimentary tract.

The first of these propositions is, I think, proven. Not only are the experiments and records here given powerful

affirmations, but there is in the profession a steadily-increasing belief in its truth which would require much more negative testimony than has yet been offered.

I would not be misunderstood. I do not think that as yet we can sustain the statement that phthisis is contagious—acquired by mere contact, or infection, if the term be limited to simply a hidden subtle miasm communicating the disease—but I do hold that particles of matter from the site of disease in a phthical patient may be carried, planted in suitable soil, and incite phthisis. I cannot think that all are liable to so acquire the disease.

I would go further, and say that probably only those may so contract phthisis who by reason of lowered vitality, through previous sickness or long watching in the sick-room, or those who have local congestion or inflammation in the respiratory tract. The fixation of a minute particle of dried sputum from a phthical patient may constitute an effective inoculation. This leads me to express my belief in the possibility of an auto-inoculation—in so far as the *débris* from a tuberculous lung coming in contact with the larynx denuded of spithelum may cause laryngeal tuberculosis.

The second proposition, that phthisis may be caused by eating the flesh of tuberculous animals or drinking the milk of tuberculous cows may also be received with the same limitations as the first, *i.e.*, that there are conditions which favour the development already existing in the individual; and, as Mr. Law, of Cornell University, has well said, 'this embraces such a large class that the interests involved are almost illimitable.'

I will not detain you by detailed suggestions as to our duty if the position maintained in this paper be true. There should be frequent change of the atmosphere in the sick-room, complete disinfection of all clothing or vessels holding expectorated material, and the close confinement of any relative of, or attendant upon, a phthical patient should be forbidden."

SUNSTROKE—HOW TO TREAT CASES.—Do the following things in the order named:—1. Carry the patient to the nearest shade, preferably a drug-store. 2. Place the patient's face up, head slightly raised, where there is a draught of air. 3. Open the clothing around the neck and at once apply cold water to the head and neck, ice water preferred. 4. Keep spectators away. 5. Send for a physician. 6. Send for a patrol wagon. While waiting for the physician, continue to apply the cold water. Sponges or cloths saturated with water and applied to the neck over the jugular veins afford speedy relief in most cases. It is believed that many cases have ended fatally for want of prompt attention, the patient having been left alone until the physician or wagon arrived. Don't wait in any case; act promptly, and save the patient.

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Public Health

"Health is the first Wealth."—Emerson.

VENTILATION AND HEATING OF SCHOOLS.

A REPORT on the heating and ventilation of schools has been drawn up by Professor Thomas Carnelly, D.Sc., and presents facts as to efficiency and cost of ventilation of great importance to those concerned in school hygiene. The facts are drawn from careful inquiries instituted in 150 different schools, having a total accommodation for 111,000 children, which were personally visited, while information was derived by letter from many other quarters. In some cases, experiments were made in mechanical ventilation, for the purpose of measuring the volume of air passing through the schools, the amount of gas consumed by the gas-engine, &c. Experiments were also made as regards the effect of filtering the air. "Of the various methods of heating, the one most extensively used is the system of large hot-water pipes (low pressure). Open fires are also a very favourite method; whilst all others are much less common. Thus, of the 311 schools examined in this respect—

- 147 are heated by large low-pressure hot-water pipes (chiefly in Birmingham, Bradford, Nottingham, Leeds, and Liverpool).
- 82 are heated by open fires (more or less common in most towns. The Edinburgh schools are heated exclusively by open fires).
- 32 are heated partly by open fires and partly by stoves (22 of these are in Leeds and eight in Leicester).
- 31 are heated by small high-pressure hot-water pipes (20 of these are in Sheffield).
- 9 have adopted the mechanical system (Dundee and Aberdeen).
- 5 are heated by hot air (Salford only).
- 4 are heated by high-pressure steam pipes (Sheffield and Newcastle).
- 1 is heated by low-pressure steam pipes (Leicester).

Of the various methods of ventilating, the most common mode of admitting fresh air is by open windows, doors, &c., and also in many cases by Tobin's tubes; whilst the most usual outlet is the chimney of an open fire, or ventilators in the roof."

As to first cost, this varies greatly in different schools. With a system of natural ventilation the prime cost may be 1s. 1d. up to 6s. 7d. per head; in mechanically ventilated schools the first cost appears to be very uniform, varying from 22s. to 27s. per head; but at Ashley-road, Aberdeen, it was only 16s. 6d. per head. This school consists of an oblong, three-storey block, 109 feet long by 84 feet wide. There is a long central entrance-hall, running the whole length of the building, with classrooms ranged on each side and on the upper flats also at each end. The basement is excavated to a depth of about 7 feet, forming a large fresh-air chamber, a part of which contains the heating apparatus, gas-engine, and fan. With a building constructed in this manner, the arrangement and fixing of the air-flues and shafts is much simpler, and the expense greatly curtailed.

With open fireplaces the average appears to be, for England, 60 pupils per fire; in Scotland, 80 per fire. Taking all the facts into consideration, it may be said that the first cost of the several systems is as follows:—

		Cost of Heating and Ventilating only— Per School of Head. 1,000 Pupils.	
		s.	£
Natural Ventilation	Open fires	4	200
	Small hot-water pipes (high pressure) 8	...	300
	Large " " (low pressure) 10	...	500
Mechanical Ventilation	As applied to schools suitably designed	17	850
	As applied to ordinary schools	20	1,000

As an example, it may be mentioned that the average total cost of accommodation per scholar for buildings and furnishings in all the schools which have been built by the Dundee Board was about £9 5s.; whereas, if mechanical ventilation had been applied, the cost, according to the figures given above, would have been about £9 15s. per head.

It may be pointed out as a direct saving, that less lofty rooms are requisite in schools ventilated mechanically; so that, if even a foot of building can properly be dispensed with on the height of each floor of a school, the lessened cost would largely defray the introduction of the system.

As to the total annual cost per head, the difference between the various natural systems is not very great, ranging from 2½d. in the case of "stoves," to 3½d. per head in the case of small high-pressure hot-water pipes, or from 30½ to 50½ lbs. of coal per head, supposing that the cost of coal and the liberality in using it is the same as in Dundee.

The annual cost of mechanical ventilation is distinctly higher than that of any of the natural systems. This, however, is necessarily so; for since more air is driven through the school with the former, more coal will, of course, be required to warm it to a given temperature.

The comparative annual cost of the "mechanical" and "natural" systems may be stated thus:—

	Cost per Head. d.		For a School of 1,000 Pupils. £ s. d.		
Natural or ordinary system of heating and ventilating	2½		11	9	2
Mechanical systems	7½		31	5	0
Difference			£19 15 10		

As to efficiency, analysis of the air of schools shows that with those systems in which the rooms are heated by radiation rather than by conduction, the air is much more highly charged with micro-organisms than with those systems in which the rooms are heated more by conduction than by radiation. Thus in the naturally ventilated schools examined the following results were obtained:—

	No. of Micro-organisms per litre of Air.			
	Dundee.	Aberdeen.	Edinburgh.	Newcastle.
Open fires—ordinary grates (here radiation is at a maximum and conduction at a minimum)	169	87	66	224
Open fires—Manchester grates	...	...	47	...
Large hot-water pipes (low pressure) Inter-mediate	96	...	...	...
Small hot-water pipes (high pressure).—Here conduction is at a maximum and radiation at a minimum.	85	35	...	190

A table is given showing that, notwithstanding the very great improvement in the purity of the air, the temperature is considerably higher in the mechanically ventilated schools than in those under the ordinary systems. To produce such an improvement in purity by the ordinary methods of opening windows, &c., would reduce the temperature to a very uncomfortable and dangerous degree.

Excess over Outside Air.	Dundee Schools (Carnelly, Haldane, and Anderson).		Aberdeen Schools (Brazier; Thomson).	
	Mechanically Ventilated.	Naturally Ventilated.	Mechanically Ventilated.	Naturally Ventilated.
Temperature	1	0.66	1	0.9
Carbonic acid	1	1.7	1	1.6
Organic matter	1	7.0	...	...
Micro-organisms...	1	9.2	1	7.2

Mechanical ventilation reduces the number of micro-organisms in the air, not merely during the time it is in action, but it has been proved to have also a very marked effect after it has been stopped and replaced by natural ventilation, this effect extending over a period of many days at least. Mechanical ventilation also, as shown by Professor Brazier in the Aberdeen schools, keeps the composition of the air more or less constant in the different parts of a room; whereas, with natural ventilation, it is liable to be much less pure at one part than another.

In mechanically ventilated schools, air-filters prove effective in removing much of the solid impurities from the air passing through them, as is shown by the fact that the dirt which had collected thereon after they had been in use for seven weeks was 2½ lbs. This dirt consisted chiefly of soot and dust, and was very black and filthy-looking.* One set of filters will last a year, and require cleaning about twice in that time; 3s. per annum at the most should defray the cost of filtering the air in any school.

The extra cost entailed by mechanical ventilation over and above that of ordinary methods (including both annual expenses and interest on first cost) is about £39 a year in a school for 1,000 children, or 9½d. per head of accommodation. For a school for 1,500 children, the cost would be only three-fourths of the above. Part of the cost could be met quite easily by reducing the customary height of the rooms by one or two feet. This reduction in height would not at all detract from the health or comfort of the children. Thus, a reduction of the usual height of the rooms by one foot would, at 2d. per cubic foot, reduce the first cost of the school by about £70 on a school for 1,000 children, or 1s. 6d. per head. Statistics are further given in the report to show how the ventilation of schools affects the health and education of the children. It appears that in Aberdeen, in the mechanically ventilated schools, the Government grant earned is 21s. 8d. as against 19s. 6d. with natural ventilation.

HOW TO ESTIMATE FOULNESS IN THE AIR.

A MODE of finding carbon dioxide and "A New Method of Estimating the Proportion of Carbon Dioxide in Air," are given as follows by Dr. Cassidy in the Ontario Board of Health report: "The estimation of the volume of carbon dioxide gas it contains is at present the only experimental method of judging of the condition of the air in enclosed areas, and, therefore, it is important, from a sanitary point of view, to possess an easy and rapid

means of ascertaining the amount of this gas present in the atmosphere.

"Several plans have been proposed for this purpose, all of which are based on the milkiness produced by carbon dioxide in a colourless solution of lime or baryta, and, therefore, on a qualitative appearance, which is not directly connected with the amount of gas actually present. The new apparatus devised by Dr. R. Blockmann possesses the merit of giving quantitative results, and of being so simple in its action that no chemical knowledge is required in order to use it. It is also very cheap. The process is based on the employment of a sufficient volume of the air under trial to saturate, by means of the carbon dioxide gas present in it, a given amount of lime-water of a certain strength.

"In order to recognize the fact of this saturation, a few drops of a solution of phenol-phthalein are added to the lime-water, until it assumes a visibly red tint. The colour remains so long as the liquid continues alkaline, but directly the caustic lime is all converted into the carbonate, a very small excess of carbon dioxide is sufficient entirely to destroy all trace of the red tint. The apparatus consists of a glass bottle capable of holding 500 cubic centimetres, or half a litre; a hollow, bent, glass tube, used in sucking the air out of the bottle; a solution of phenol-phthalein; and a solution of lime-water one-tenth the strength of the volumetric solution, or one in which one cubic centimetre of lime-water is equal to one-tenth of a milligramme of carbon dioxide.

"The mode of using it is as follows: The bottle is filled with the air to be tested by sucking out the air contained in it through the bent glass tube; one half ounce of lime-water is poured into the bottle, together with three drops of the solution of the phenol-phthalein, and the bottle is then corked and shaken for three or four minutes; if the liquid is still red, the bottle is filled a second time with air, corked and shaken as before, and the process is repeated until the colour in the liquid vanishes. If the colour does not completely fade after any particular filling, but fades immediately on making another filling, we may take the one before the last as the correct reading. Thus, in testing the air at the Brock Avenue School, I found that the red tint had nearly vanished at the second filling, and that it disappeared completely on filling the bottle the third time.

"The amount of carbon dioxide was, therefore, not more than for two fillings, and but little less, or, in round numbers, .806. If the colour remains for four fillings, the air is very good; if it remains for three, it is good; if it disappears on the second filling, it is on the borders of what sanitarians call bad air; if the colour goes on the first filling, the air is so impure as to render it wholly unfit to be breathed. A table has been prepared, showing the exact quantities of carbon dioxide gas present in 1,000 volumes of air, as indicated by the results of each filling—from the first to the fourth. Thus—one filling, 1.61 carbon dioxide per mille; two fillings, .806 carbon dioxide per mille; three fillings, .537 carbon dioxide per mille; four fillings, .400 at 60 degs. Fahrenheit.

"A correction is not necessary for a temperature over or under 60 degs., as it would involve no greater difference than a factor in the third decimal place. By increasing the quantity of lime-water, the presence of much larger volumes of the gas can be ascertained; thus, with one ounce of lime-water, a discolouration at the first filling would imply the existence of 3.22 volumes per mille."

* The incoming fresh air is filtered by passing through coarse jute cloth stretched on frames across the air-chamber. This is very effective, and the cost a mere trifle. The most suitable jute cloth is known as light hesian. It weighs 6½ oz. per yard of 40 inches wide, and costs 2d. per yard. It contains 67 meshes to the square inch, and is composed of threads whose diameter is one-fourth that of the mesh. If the filtering surface be sufficiently large, the amount of friction is quite inappreciable.

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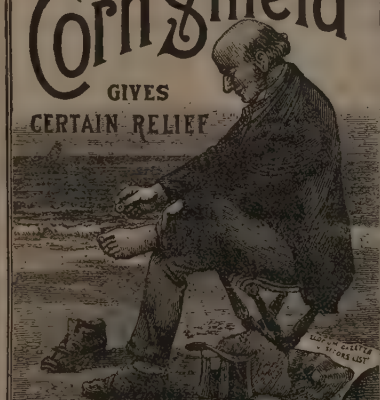
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—Charles Mackay.

THE ADAPTIVENESS OF NATURE.

OBSERVE how necessary is the coincidence of all these facts for the development of all the higher apes, and especially of man, their ultimate outcome. The large tropical fruits require hands (or something analogous) to pull and eat them. Hence the lemur-like or squirrel-like paw gets developed in true monkeys into the genuine hand, which is used in grasping, picking, and eating the fruit. How needful such a development is for fruit-eaters we see by analogy in the case of the like-minded fruit-eating birds, which either, as in the parrot, have a hand-like foot, or else, failing that, as in the toucans and horn-bills, have a large and preposterously developed grasping beak to perform the same office. Even the squirrel holds his nut in his paws; the parrot holds it in one claw, hand-wise; the monkey, the highest and most specialized of all, holds it in a perfect hand, between thumb and fingers.

Furthermore, these tropical fruits and nuts have almost always a thick and disagreeable rind or husk, which must be stripped off and thrown away before the edible pulp or kernel is arrived at. The orange and mango are good cases in point. This disagreeable rind is put there by natural selection in order to repel insects, small rodents, and other useless creatures (from the plant's point of view), which would eat off the pulp on the tree, as wasps eat pears, without doing anything in return to disperse the seeds; but the animal that can pick the fruit can also tear off the rind, and in this act, also, hands or their equivalents come in useful. In all these ways the development of the fruits, and the development of the fruit-eaters, must necessarily have gone on by parallel stages.

We can see, too, if we reflect for a moment, that man could only have been evolved as we now know him through just such a tree-haunting ancestry as this. For, in the first place, man absolutely bases himself upon the possession of a hand, which, first rudely stretched out to grasp the branches of trees, and afterwards further moulded by use in picking and stripping nuts and fruits, can at last be applied to such different uses from those by which it was originally developed. Then, again, the habit of grasping (as Mr. Herbert Spencer has shown) implies a wider conception of the physical properties of things; so that all the most intelligent animals in a state of nature—monkeys, squirrels, elephants, parrots—are those which have a grasping organ. Once more, specially nutritious food allows periods of comparative leisure, during which the faculties can be devoted to other objects, as we see in the restless curiosity of monkeys, in their gambols and antics, and finally in the artistic and industrial energies of man himself. If an animal lives upon grass or leaves, he has to concentrate almost all his vital activity on the mechanical labour of feeding and digesting; if he lives upon richer and more nutritious food, he has organic and muscular leisure in abundance. Man, by still further enriching his food-stuffs, through the deliberate selection and cultivation of fruits and cereals, and through the art of cooking, has allowed himself yet greater leisure for other arts, and so has attained his present pre-eminence.

But a consideration of his structure shows us conclusively that without the arboreal fruit-eating ancestors from whom he is descended, he could never have become just what he is. His hand is the index of his arboreal origin.—*Grant Allen in the "North American Review."*

TRAINING FOR FUTURE GENERATIONS.

IF we cannot establish a perfect standard of health, we can, nevertheless, lay foundations for such a standard,—ay! of the highest and the noblest. The knowledge of this fact is the greatest of all consolations for those who labour in this day without any hope of living to see their best results in days to come. We have, moreover, realized something hoped for, which, though it be something partial, is yet a direct result of what we have done, for we have seen death-rates decreasing under our skill, a first instalment of the greater triumphs that are to follow. In the work we, as sanitarians, have performed, we have laid the train and started the training. And, after all, training is everything. Our forefathers trained for short life, and succeeded in the most remarkable degree. We have commenced to train for long life, and we are succeeding in our way quite as completely as they in theirs. They, without intending it, trained for disease; we, fully intending it, train for health,—health that is pure, progressive, and persistent. Our labours in this direction cannot be too manifold, too earnest, too continuous; for in them, if they prove successful, we insure benefits extending beyond ourselves, our own lives, our own generation. There is not the minutest victory which we can win in our conflict with disease and death that is not stamped for ever on the revolving life that has to be made manifest through future organic forms. The vitality changes not; but the form it animates so changes, through the development it undergoes, that it is influenced throughout all the organic domain. To us it is not given to supplement vitality, whatever we do; for vitality in its essence is not under our command. But to us is given the whole possession of the organism by which the vitality is made manifest, and in which it is potential. We see each organism reproducible after its kind; moulded to carry life on to a fixed duration, long or short according to the productive sample on which it is based. This sample we can debase or improve. When, therefore, we improve the sample, we improve the product of the sample, and our work becomes immortal in proportion as it reduces mortality.—*Dr. Richardson in the "Asclepiad."*

HELEN—"Mamma, what is a *casus belli*?" Mamma—"My child, never speak of anything so indelicate. It is the Latin for stomach-ache."

It is recorded of an Archbishop of Dublin, who was very penurious in his habits, that he went one night, muffled up in a large old cloak, to the shop of a man named Moore, to purchase a cheese. After a great deal of bargaining, he completed his purchase, and before leaving the place inquired of Moore what was the best way to keep the cheese. The grocer, who had detected his Lordship under his disguise, replied, with true Irish humour, "Why, sir, I don't know how to keep cheeses, my business is to get rid of them; but if you will follow what I hear is the Archbishop's plan, you will find it answer admirably." "What plan is that, my friend?" asked his Grace, rather puzzled. "Faith, by my conscience," said the shopkeeper, "neither cut it yourself, nor let anybody else cut it."

Findings from the Journals

"Th' ingredients of health and long life are
Great temperance, open air,
Easy labour, little care."—*Sir Philip Sydney.*

The Canary Isles as a Health-Resort.—As regards sanitary arrangements, Orotava is no better than its neighbours—that is to say, it has cesspools and no elaborate system of drainage. When it is considered that where a system of drainage exists it must be carefully made, carefully supervised, and amply supplied with water, or it will communicate infection from house to house, I must say I am of opinion that cesspools would be better than a half-hearted imitation of a grand system of sewerage. Water is too precious here to be used freely to flush sewers. On the other hand, the dryness of air and soil are such that the cesspools virtually become dry-earth systems. This view is supported by the testimony of Dr. Perez and his son, who assert that they have never yet seen a case of enteric fever which originated in Orotava. The true danger of the cesspool system in dry places is that all the subsoil water becomes contaminated, and some people are always foolish enough to believe that any water that is clear and nice tasting is good to drink. The water supply of Orotava, like that of all the lower parts of the Canary Islands, is brought from the mountains to a fountain in the town, and fetched thence to the hotels. The water is good enough at its source, provided it is duly protected from contamination during its run through the town. The water here has been analyzed by Dr. Frankland, the well-known London analyst. He says of it:—"Very good quality. It contains a moderate quantity of saline matter and a very small proportion of organic matter." The fact that this is the only town in the islands where I could obtain an analysis of the drinking water shows how much more advanced the authorities are under the guidance of the Drs. Perez than are those of other towns. At the same time, nothing is said as to the time of year when the analysis was made. I would venture to suggest five or six more analyses being taken at different seasons during rainy weather and during dry, and so on, before the authorities are absolutely convinced as to the purity of the water. Since writing the above, I have received information that the Orotava drinking water has been further repeatedly tested by an analyst residing in the locality, and it is perfectly pure. Visitors need therefore have no fear whatever on this score. The dry-earth system of closets is in vogue at the Grand Hotel. I could not ascertain whether the drains for removing fluid refuse were properly trapped, but I noticed no disagreeable smell. Besides the Grand Hotel Company, with its four distinct houses, there is an English boarding-house kept by Mr. Turnbull. I had not time to inspect this house, and cannot, therefore, speak of it with any personal authority. Miss Latimer, a lady who has recently published an account of her visit to the Canaries, stayed there, and seems to have been comfortable. The cost of excursions in the neighbourhood has been described as wonderfully cheap. The charges are certainly very moderate, but considering that two or three years ago the country was a *terra incognita* they are nothing remarkable. The journey to Icod and back cost us a sovereign, besides a couple of pesetas to the driver; a journey of some eight miles more at Ilfracombe cost thirty shillings exclusive of the driver—not a very great difference.—*Dr. Thurstan in the "Sanitary Record."*

Children's Play and Mental Development.—The play of the young child is but the spontaneous action of the brain centres when well nourished and left free; the organized game is a means of co-ordinating this spontaneity, which is the basis of intellectual action. In the older child play becomes something more than the expression of spontaneous action; it may be said to be voluntary and purposive, as in the cricket-field, where the action of each boy is determined by that of others. All this kind of action is capital training for the perceptive faculties; the passages for impressions from without to the brain are exercised; the word of command from the captain, the sight of the flying ball, are impressions quickly followed by rapid and accurate action. The period of waiting in the cricket-field is a lesson in attention; the boy's own spontaneity is thus kept fully under control and co-ordinated with the action of others. The brain training thus given is not dissimilar to that required for mental action; there is the accuracy of action controlled by the surroundings, the increasing quickness of reflex, the adaptation to circumstances, faculties all of which are so necessary in mental action. Organized play produces a most useful effect. It trains the boy to do correctly just what he is told to do, and while his spontaneous action is encouraged, he is kept ever ready to act according to circumstances. Play is healthful; so is the alternation of mental work and active play. In mental action the brain centres probably act much in stimulating one another; in play the muscles are stimulated by the brain centres, and the purely mental action is diminished. Thus, play is not merely muscular exercise, but a change in the kind of brain action, and probably of the action of the special centres. Even if the fact were not well established, the physiologist would expect to find that moderate athletics and success in mental work are not divorced from one another. This is well illustrated in the list of scholarships recently gained by the boys of St. Paul's School; all the athletic leaders are named in the list. The tendency to self-contemplation which is engendered by the modern system of competitive examination is to some extent counteracted by athletics. In the examination the individual wins, not his class; in the cricket club the eleven wins, though one individual may make a winning score. It is sometimes said that athletics make good bodies to the neglect of mental culture. That may be so when too much time and attention are given to the river and the cricket-field; but it should be well understood that a highly organized game does exercise the brain as well as the muscles, though not in exactly the same way nor probably in the same parts as so-called intellectual training. A just balance between play and work may be struck for the individual, by noting what duration of mental exercise can be borne without the signs of fatigue following. Recreation of the athletic kind is most useful in turning "the brain overpressed with thoughts" to other modes of action, and preventing it from continuously acting in mental modes producing a cloud of uncontrolled thoughts, to be followed by troubled sleep and dreams. Habits of bodily activity are often the best cure for sickly states of mind.—*British Medical Journal.*

♦ ♦ ♦
Want of Leisure.—Probably no candid observer can doubt that life in modern times is more vehement and strenuous, more taxing to mind and physique than it was in ancient days. Steam, electricity, the facilities for travel, the spread of education, the growth of competition, all these and many other causes have co-operated to this

end. Yet it would obviously be a great error to judge the life of the entire nation by the conditions which prevail in the great centres of industry, commerce, and intellectual life. We have only to penetrate a little way into the rural districts of these islands to discover that the stream of progress which flows with so mighty and rapid a flood in London or Manchester, Glasgow or Belfast, there lags behind and creeps along with almost the tranquillity and calm of the olden time. There are numerous localities not many miles from the great trunk lines of railway where the conditions of life have undergone little change in the last 200 years, and where the impact of modern civilization has been but slightly felt against the bulwarks of immemorial usage and ancient prejudice. But the general rule has certainly been one of rapid progress and growing tension of life. It must not, however, be too confidently assumed that this tendency is wholly or even mainly evil. Each age realizes more or less clearly its own peculiar dangers, and is very apt to ignore the evils from which its mistakes are frequently a reaction. We hear and speak much now of the evils of over-pressure, the dangers of undue excitement. We forget that mental stagnation is also evil, that intellectual inanition may carry in its train consequences even more prejudicial than over-stimulation, and that the due exercise of the faculties is as essential to their strength and activity as rest. Probably one reason why women, as a class, are more subject than men to the minor ailments,—to neuralgias, dyspepsias, and debilities,—is that their life, at least among the wealthier classes, is so frequently deficient in variety, activity, and continuous occupation. Dulness is a foe as well as over-excitement,—idleness may be as evil physically and intellectually as over-work, and is undoubtedly more dangerous from the moral point of view. While, then, we think modern life is somewhat too anxious and over-strained, we must admit that it is largely free from the mischief which springs from intellectual torpor. The judicious application of the brake may be desirable, but we must not fancy that there would be any wisdom in attempting to stop the coach of modern progress, even if such an attempt were not obviously foredoomed to failure. Half a century ago men found it difficult to imagine that they should ever be able to travel forty or fifty miles an hour without physical hurt. Now we smile at such fears, and in a wider sense we may perhaps in time get so accustomed to the accelerated velocity of modern progress that we shall cease to remark or dread its speed.—*Lancet*.

BE very particular about disinfecting the kitchen sink. Washing-soda, two tablespoonfuls to a gallon of boiling water, makes an excellent wash to pour hot into the sink at night after you have finished using it.

THE irrepressible candidate's reply to the question, What do you understand by physics, electricity, and magnetism? was "Physics is pills and things; electricity is the telegraph wires; magnetism is what you take in connection with rhubarb."

Harper's Magazine for April is a readable and interesting number. The paper on "Characteristic Parisian Cafés" will recall vividly many memories of Paris and its boulevards, while "Flying under Water," and the third instalment of "Norway and its People," with their graphic illustrations, will also prove captivating to old and young alike. "The Family Physician," a paper by A. H. Smith, M.D., discourses in a happy fashion on the modern relations of the doctor to his patients and science alike.

IMPORTANT ANNOUNCEMENT.

COMMENCEMENT OF A NEW VOLUME ON FRIDAY, APRIL 5th.

BONUSES TO SUBSCRIBERS TO "HEALTH."

HEALTH, as our readers are aware, may be obtained of all Booksellers and Newsagents, and at the Railway Book-stalls, on the day of publication. It may also be ordered from the PUBLISHER, 2, Paternoster-square, London, E.C., who will send the journal, post free, for a year, on receipt of postal orders for 10s. 10d.

As many of our readers who live in remote districts prefer to obtain HEALTH from the Publisher direct, and as we are desirous of increasing the already large number of subscribers who give us a yearly order for the journal, we offer the following FREE GIFTS and BONUSES to all who subscribe to HEALTH for one year or longer:—

(1.) To each Subscriber who remits 10s. 10d. to the Publisher, entitling him (or her) to receive one copy of HEALTH, post free, for one year, we shall present a copy of Dr. Andrew Wilson's work, entitled "A Manual of Health Science" (Longmans & Co.), value 2s. 6d.

(2.) To each subscriber who remits 21s. 8d., entitling him or her to receive two copies of HEALTH weekly, post free, for one year (or one copy for two years), we will present Dr. Richardson's "Ministry of Health" (Chatto & Windus), value 6s. The copies of HEALTH so ordered may be posted to separate addresses.

(3.) To each person who subscribes 32s. 6d., for three copies of HEALTH, post free, weekly, for one year, we will present the volume by Dr. Richardson mentioned above, and also the handsome, illustrated book entitled, "Studies in Life and Sense," by Dr. Andrew Wilson (Chatto & Windus), value 6s.—being a free gift of the total value of 12s.

The bonus last mentioned will also be presented to any one who succeeds in obtaining three yearly subscribers to HEALTH, and who remits to the Publisher the sum of 32s. 6d., together with the names and addresses of the persons to whom the copies are to be posted each week.

As the literary gifts above-mentioned constitute books containing solid and reliable information regarding health and other matters of popular scientific interest, it will be seen that the above scheme, while intended to increase our already large circulation, also offers distinct advantages to new subscribers who guarantee by their subscriptions a year's support to this journal. All communications regarding subscriptions and other purely business details connected with HEALTH should be addressed directly to the PUBLISHER, 2, Paternoster-square, London, E.C., and not to the Editor.

Our Letter-Box

"Conference [maketh] a ready man."—*Bacon*.

NOTICES TO CORRESPONDENTS.

All Communications for the Editorial Department (including Books for Review, Specimens of Sanitary Appliances, &c.), to be addressed to "THE EDITOR OF HEALTH," 2, PATERNOSTER-SQUARE, LONDON, E.C. Those intended for the Publishing Office to be sent to MR. A. P. WATT, THE PUBLISHER, at the same address.

RULES FOR CORRESPONDENTS.

OWING to the mass of letters which reaches us each week, we respectfully direct the attention of Correspondents, desiring replies in the LETTER-BOX DEPARTMENT of HEALTH, to the following rules:—

"ELECTRICITY IS LIFE."
(TRADE MARK.)

PULVERMACHER'S

WORLD-FAMED GALVANIC BELTS,

FOR the CURE of NERVOUS DISEASES,
HAVE RECEIVED TESTIMONIALS from
THREE PHYSICIANS to
HER MAJESTY THE QUEEN,
THE ACADEMIE DE MEDECINE of Paris and
FORTY MEMBERS of the
ROYAL COLLEGE of PHYSICIANS of LONDON.

RECENT TESTIMONIALS.

GALVANISM v. SCIATICA and BLOOD POISONING.

246, High-street, Perth, N.B., March 19th, 1889.
Gentlemen,—This is to certify that I received one of your special Combined Bands for a friend of mine who was suffering from sciatica and blood poisoning, and will you kindly allow me to add my testimony to the many thousands you have already received? Previous to my friend getting your Band he had been very ill for fully twelve months, and attended by various doctors, some of the ablest in Scotland; everything was tried that could be thought upon, and he was given up as incurable. As a last resource we sent for your Galvanic Appliance, which in a short time produced marvellous results, and speedily brought the desired relief, and I can now inform you that my friend is again at business after 2½ years of suffering. This is a wonder to many, and no reason or explanation can be given regarding this marvellous restoration excepting your treatment, as all drugs, doctors, &c., were given up before we put the Belt on.—I am, yours faithfully,

J. G. WILSON.

Messrs. J. L. Pulvermacher & Co., 194, Regent-street, W.

GALVANISM v. SPINAL WEAKNESS.

Wimbledon, near London, S.W., March 18th, 1889.

Dear Sir,—My object in writing to you is to inform you that some time ago I had a German lady living with me who was bent nearly double. She had been to several hospitals and many doctors, but they all gave her up as incurable. At length she was induced to write to you for advice, which she did, and you recommended her a Combined Band for her back. The patient bought one, and, as you are already aware, she was quite restored in seven weeks. In fact, when she called on me I thought it was an apparition.—I remain, yours truly,

(Mrs.) M. STOPPERS.

Mr. J. L. Pulvermacher, 194, Regent-street, W.

GALVANISM v. NERVOUS EXHAUSTION and DEBILITY.

East Challow, Wantage, March 18th, 1889.

Dear Sir,—I am writing to tell you of the great benefit I have derived from your Galvanic Combined Band for nervous exhaustion and debility. It has proved an immense boon to me.—Yours faithfully,

(Miss) A. BARNET.

J. L. Pulvermacher, Esq., 194, Regent-street, W.

GALVANISM v. GENERAL DEBILITY and WEAKNESS.

3, Morpeth-terrace, Victoria-street, Westminster, 4th March, 1889.

Dear Sir,—I wrote to you a year ago telling you of the great benefit I had derived from your treatment, and you will be pleased to hear that the cure is permanent. I have had several inquiries respecting my case, which I willingly answered. I had a letter to-day from a young man in Northampton, and I gave him all the particulars of my case, and strongly urged him to give up appliances a trial.—Yours faithfully,

W. BROWN.

Mr. Pulvermacher, 194, Regent-street, W.

GALVANISM v. EXTREME NERVOUS EXHAUSTION.

52, Argo-road, Waterloo, Liverpool, 1st March, 1889.

Gentlemen,—In September last I sent to you for one of your Combined Bands for my wife, who was then suffering from extreme nervous exhaustion. I now wish to bear testimony to the great benefit she has derived from its use. She is now quite restored, and has discontinued its use for the past three months. I would be glad to have a few pamphlets, so that I could advertise the benefit of your treatment. The one you sent me I gave away to a friend.—Yours faithfully,

THOS. S. NEWCOMBE.

Messrs. J. L. Pulvermacher & Co., 194, Regent-street, W.

GALVANISM v. NERVOUS EXHAUSTION.

Kirkby Lonsdale, 20th Feb., 1889.

Dear Sir,—You will be pleased to hear that I have derived a great amount of benefit from your treatment, and since wearing your Galvanic Belt I am another man altogether. Before wearing the Belt I was very low and nervous, but now I feel quite different.—Yours truly,

G. WORMNELL.

Mr. Pulvermacher, 194, Regent-street, W.

GALVANISM v. NERVOUS EXHAUSTION.

The distressing symptoms of Nervous Exhaustion and Debility are speedily removed by means of PULVERMACHER'S world-famed GALVANIC BELTS, which are so arranged as to convey a powerful electric current direct to the affected parts, gradually stimulating and strengthening all the nerves and muscles, and speedily arresting all symptoms of waste and decay.

ADVICE PERSONALLY or by LETTER, free of charge.

FOR FURTHER TESTIMONIALS, both Medical and Private, see new Pamphlet, "GALVANISM: NATURE'S CHIEF RESTORER OF IMPAIRED VITAL ENERGY," post free on application to

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1. All questions are answered free of charge in the columns of HEALTH. A limited space only, is available for the insertion of replies each week.
2. All letters must be legibly addressed to "The Editor of HEALTH, 2, Paternoster-square, London, E.C., and to no other address.
3. Questions to which answers are desired by post, are so replied to solely at the Editor's discretion. If no answer is sent by post, the query will be replied to in the "Letter-Box" columns of HEALTH. A stamped addressed envelope must accompany all queries to which a private reply is desired.
4. Addresses of physicians and surgeons will, as heretofore, be forwarded FREE to Correspondents on their enclosing a stamped addressed envelope for reply.
5. Correspondents are requested to write on one side of the paper only, and to make their inquiries as brief as may be consistent with clearness.
6. From the necessity of sending HEALTH to press early in the week, no Correspondent can be replied to in the "Letter-Box" columns in the same week in which the inquiry is received. Replies crushed out of any issue will be found in the succeeding number.
7. No Post Cards must be used in sending queries. Violation of this rule deprives the sender of the privilege of a reply.

QUERIES AND ANSWERS.

REPLIES: GENERAL, SANITARY, AND MEDICAL.

END.—You should take a dessertspoonful of Scott's Cod Oil Emulsion, after meals, thrice daily. If you take supper immediately before bedtime, you will suffer from disturbed night's rest, because digestion will be active when it should have ceased.

RUFUS.—The symptoms you name are indicative of a gouty tendency. Try what drinking Pitkeathly Water with Lithia (Messrs. Reid & Donald, Perth) will do for your case. You should apply Vinolia to the irritated parts. If not cured, write again.

J. O.—What you send is certainly a piece or joint of a tape-worm. See advice given to "T. Bridges" in HEALTH, No. 309. Repeat the treatment exactly as there prescribed once a week, until you are cured.

RUBOR.—Try the effect of the following pill:—Powdered ipecacuanha, half a grain; powdered capsicum, one grain; powdered rhubarb, two grains; extract of gentian, three grains. Six such pills to be made, and one to be taken half an hour before dinner when there is any liver irritation.

G. ELDER.—Use for your hair the following lotion:—Carbolic acid, half a drachm; tincture of nux vomica, two drachms; tincture of cantharides, B. P., two drachms; tincture of cinchona, one ounce; eau de Cologne and cocoa-nut oil, of each a sufficiency to make up four ounces. Mix. To be well rubbed into the roots of the hair with a soft sponge once or twice a day.

STUDENT.—You may try the recipe given to "R. Mair" in HEALTH, No. 308.

G. W.—We recommend you to take fifteen drops of Wyeth's Dialysed Iron in water after your meals thrice daily. You can continue this tonic for, say, a couple of weeks at a time, and then resume it after an interval, if you have not cured your ailment. You should live generously, but plainly; and it is possible you may find that a dessertspoonful of Scott's Pure Cod Oil Emulsion, taken after your meals, when you cease the iron, will aid your cure.

J. G. E.—Wash the hair once a fortnight or so with Bayley's Spermaceti Soap and tepid water (17, Cockspur-street, London, S.W.).

PONTIFEX.—Apply Vinolia to the affected part, as a remedy likely to cure you. Wash the part with Vinolia Soap. You must, however, beware of washing the head too frequently. This is a common source of hair-weakness. If not cured, write again.

W. J. B.—What you name is nothing at all serious, and proceeds mostly from constipation. Read the pamphlet, "A Lecture to Young Men" (post free for 1s. 1d. from Mr. Renshaw, 356, Strand, London, W.C.), and you will find your case fully described therein. Use the remedies noted in the pamphlet as curative of constipation, and you will get quite well.

INQUIRER.—It is probable your work-hours are too long, and, if the ventilation is bad or defective, your symptoms may thus be fully accounted for. Take a tonic, such as Inman's Syrup of the Hypophosphites, a teaspoonful in a wineglass of water after meals, twice daily, and this may cure you. If not, write again.

HOPE.—We should say the only way open to you is to employ judicious exercise of the part by way of increasing growth. If you take the step you propose, you will probably find that your wishes will be realized.

B. STEEL.—Apply to the Medical Battery Co., 52, Oxford-street, London, W., who will advise you regarding treatment.

HEADACHE.—Adopt the diet-advice, &c., given to "Peter Hay" in *HEALTH*, No. 310, and if your liver is at fault, this treatment will be likely to cure you.

G. S.—Read the pamphlet, "A Lecture to Young Men" (Fifth Edition. Post free for 1s. 1d. from Mr. Renshaw, 356, Strand, London, W.C.), and adopt the remedies therein named for the cure of constipation. You would probably also find that the iron tonic recommended in the pamphlet, taken after food, would benefit you. Avoid all acid foods, and such articles as cheese, pastry, and salt foods. By regulating your digestion as indicated in the pamphlet, you will get well. If you are not cured, however, write again.

KILMARNOCK.—Your symptoms indicate simply lack of tone, and possibly some digestive disturbance in addition. We advise you, first of all, to regulate your diet according to the rules laid down to "Lodger" in last week's *HEALTH*; and, after meals, twice daily, take a teaspoonful of Inman's Syrup of the Hypophosphites (advertised in our pages) in a wineglass of water, as a suitable tonic. This will brace up your system. Let us hear how you are after a trial of this advice.

WEAK CIRCULATION.—In such a case, try the effect of giving a dessertspoonful of Thomson's Cod Oil Cream (Dublin-street, Edinburgh) after meals, twice or thrice daily. This will act as a nutrient and tonic, and brace up the system. We should also regard the case you name as one in which a little alcohol, given with meals, would do good. A glass or two of good claret or port wine for a person of that age with dinner often proves a valuable remedy for deficient food-assimilation. Clothe warmly, and avoid chills. Try applying a little Vinolia to the hands.

J. C. HAMILTON.—In your case, you must make a radical change in your food-habits. Follow out the directions given to "Soho" in the last number of *HEALTH*. Take no tonic, except fifteen drops of Wyeth's Dialysed Iron thrice daily after food in water, and that only for a time. For the rest, take plenty of open-air exercise, and continue your cold sponging each morning.

When your kidney symptoms are present, give up all alcohol, and drink regularly the Pitkeathly Water with Lithia, to be had from Messrs. Reid & Donald, Perth.

R. E. A.—Apply to Mr. Pulvermacher, 194, Regent-street, London, W., and take his advice regarding a belt. Try the plan of taking at bedtime for, say, three or four nights running, twenty grains bromide of potash, and let your last meal be taken an hour and a half before bedtime. If this plan does not suffice for your cure, write again, and we will advise you further. It will be wiser for you to try a simple plan such as that we recommend, in preference to taking any sleep-producing drugs.

G. R.—1. No peptonizing powders are required for that age. The mother's milk, or one cow's milk suitably diluted, is the proper food; while Mellin's Food may be given a little later. You do not state the reason for your enquiry, and, therefore, we can only reply to you as generally as you make your statement. A healthy infant requires no peptonizing of its milk; if otherwise, a medical man alone can decide the point. 2. What do you mean by "backing"? The term is not familiar to us. 3. The proper treatment is poulticing, and then free incision if required; but here again, you must assuredly trust to medical advice. The case is one for a doctor's personal supervision.

OMEGA.—1. The diet you name is quite equal to mutton as a nutrient. It is less nutritious, slightly, than beef. 2. Take it in the morning; but it does not agree with every one. Rum and milk is a preferable beverage in such a case.

JULIA T.—What you complain of is nothing serious, and will be avoided by care and especially by rest. We recommend you to take fifteen drops Fer Bravais after your meals, in water, twice daily, when your symptoms trouble you. It would certainly be better to give up taking tea so frequently, and you may try Scott's Oat Flour in its place. Plenty of fresh air exercise will also assist your cure. Let us hear from you again, if you are not cured.

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SHORT.—See advice given to "Student" in the present number.

W. G.—The person you name is a quack, and we therefore advise you to have nothing to do with him. Stammering cannot be cured by any such means as he suggests. You had better apply to Mr. B. Beasley, Hall-green, near Birmingham, and read the pamphlet he publishes on the treatment of all impediments in speech.

E. ORMSTON.—Your cure really lies in your own hands. You must look to your general health, and continue to take as much out-door exercise as possible. See also that you mix in cheerful society, and avoid all solitary brooding over fancied ailments. As a tonic, which may be taken for a time with great advantage to you, try that recommended to "Kilmarnock" in the present number. This will brace up your nervous system. Let us hear how you are after a trial of this advice.

CAPILLUS.—We recommend you to brush the hair well morning and night with a

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Horsford's Acid Phosphate.

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pair of soft brushes, and wash it once a fortnight only with Bayley's Spermaceti Soap. In addition, use the lotion recommended to "G. Elder" in the present number, and if this does not suffice to improve your case, write again. As you remark, the baldness may be hereditary. See that you wear an easy-fitting soft hat.

A. R. B.—For your styes try the following:—Acid boracic, ten grammes; distilled water, three hundred grammes. Dissolve. With a wetted piece of wadding drop some of this solution on the stye several times a day. Take also the tonic recommended to "Kilmarnock" in the present number.

S. STEVENSON.—You need not fear to consult a doctor on the subject; such cases are very common. In reply to your queries we may say—1. Very common, but varies in its degrees of intensity; 2. Yes; 3. You would require either to take chloroform or to have the parts rendered non-sensitive by cocaine. Have the operation done, rather

than be troubled with the condition. 4. You would certainly have to remain in the house about ten days or so.

IRRITANS.—We recommend you to give up coffee, which has the reputation of causing itching in many persons. Take Van Houten's Cocoa instead. For the relief of the itching, wash the parts regularly with Vinolia Soap, and apply Vinolia itself after washing as a preparation likely to cure you. Messrs. Roberts, of 76, New Bond-street, London W., will supply you with both. You may also give up your oatmeal for a time, and note the effect of this abstinence on your complaint. Take plenty of vegetable foods and be sparing of your flesh foods for a time. If not cured, by all means write again.

CLERICUS.—[Will you kindly note that all letters on the business of the Letter-box] department of HEALTH are to be addressed to the editor, and not to the publisher? What you name are only the natural symptoms of robust health, and, as you yourself rightly interpret them, they should give you cause for no uneasiness. The pamphlet you have read would show you the true physiological meaning of your symptoms. We should recommend you simply to neglect them entirely, and to take a large measure of out-door exercise. You require no tonics at all, but you must guard against constipation by following the advice given to "Soho" in the last number.

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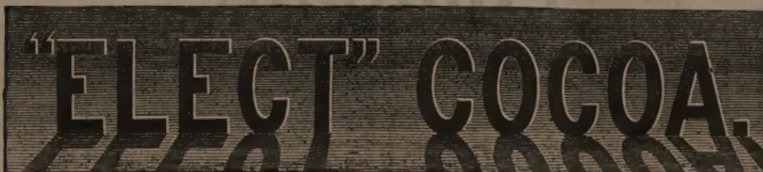
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